

Serial No.: 10/756,841
Art Unit: 2851

Attorney's Docket No.: 081468-0307559

Amendments to the Drawings:

The attached sheets of drawings include new Figure 10.

Attachment: Sheet containing Figure 10.

REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

Claims 1-53 were pending in this Application. Claims 1-14 and 44-53 remain under consideration and claims 15-43 were withdrawn from consideration by the Examiner. In the Office Action, claims 1-14 and 44-53 were rejected. Specifically,

- Claims 1-14, and 44-53 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement;
- The drawings were objected to under 37 C.F.R. § 1.83(a), as not showing all the features recited in the claims;
- Claims 1-6, 9-14, 44-53 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pub. No. 2004/0000627 to Schuster ("Schuster") in view of U.S. Pub. No. 2003/0090804 in view of Kotchick ("Kotchick");
- Claims 7 and 8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Schuster in view of Kotchick as applied to Claim 1 above, and further in view of U.S. Pub. No. 2002/0000520 to Kawaguchi ("Kawaguchi").

In this Amendment, claim 53 has been amended, the specification has been amended as shown herein, and Figure 10 has been added. Upon entry of this Amendment, claims 1-14 and 44-53 remain under consideration and pending.

Claim 53 has been amended to correct an editing error. From the context of the claim, it is readily apparent that, when the claim was first amended, the word "second" was intended, rather than "first."

Rejection of Claims 1-14, and 44-53 under 35 U.S.C. § 112, first paragraph

Claims 1-14 and 44-53 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. According to the Examiner, the claims contain subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors had possession of the invention at the time the application was filed. Applicants respectfully traverse that rejection.

The Examiner asserts that there is no support in the specification for the “two or more layers” feature recited in claims 1, 44, 48, and 53. However, there is support for the recited feature. In this regard, Applicants note the following language in paragraph [00074]: “An alternative example of metallic mirrors is mirrors having an aluminum coating that is covered with a native oxide. This native oxide grows naturally after *deposition of the aluminum coating*, when the aluminum coating is exposed to air” (emphasis added). The above sentence clearly discloses the presence of three layers of the “metallic mirror.” The first layer is the substrate (there must be something for the aluminum to be deposited *on*), the second layer is the aluminum, and the third layer is the oxide. Thus, the recitation of at least two layers in claims 1, 44, 48, and 53 is supported by the specification and the rejection of the claims under 35 U.S.C. § 112, first paragraph should be withdrawn.

According to the Examiner, claims 7 and 8 were rejected because the reflectors including a first surface to direct the beam toward the wafer and second surface that is oriented in a same direction as the first surface do not seem to be disclosed. However, an aluminum layer coated by an aluminum oxide layer, as disclosed in paragraph [00074] (see above), has an Al/ Al₂O₃ surface, as well as an Al₂O₃/air surface, as illustrated in Figure 10, for example. Notably, both

surfaces are oriented in the same direction. Accordingly, the rejection of claims 7 and 8 under 35 U.S.C. § 112, first paragraph, also should be withdrawn.

For the same reasons noted above with respect to independent claims 1, 44, 48, and 53, the rejection of dependent claims 2-14, 45-47, and 49-52 under 35 U.S.C. § 112, first paragraph, also should be withdrawn.

Objection to the drawings under 37 C.F.R. § 1.83(a)

The drawings were objected to under 37 C.F.R. § 1.83(a) for failing to show every feature of the invention specified in the claims. In particular, the Examiner stated that the limitation of claims 7 and 8 must be shown or the feature(s) cancelled from the claims. Although not expressly stated in the Office Action, the Examiner apparently refers to the feature in claims 7 and 8 of a reflector having a first surface and a second surface oriented in the same direction and apparently the Examiner has determined that this feature is not disclosed in the figures.

In this Amendment, Figure 10 is being added to illustrate already disclosed aspects of the invention, namely the Ag substrate and Al_2O_3 coating elements originally referred to in paragraph [00079]. Because these aspects were present in the original disclosure, the addition of Figure 10 does not constitute new subject matter. Paragraph [00079] also has been amended to include reference numerals to the Ag substrate and Al_2O_3 coating elements shown in Figure 10. Figure 10 clearly illustrates a first surface (Al_2O_3 /air interface) and a second surface (Al_2O_3 /Ag interface) oriented in the same direction. Accordingly, the objection to the drawings under 37 C.F.R. § 1.83(a) should be removed.

Rejection of Claims 1-6, 9-14, 44-53 under 35 U.S.C. § 103(a) as being unpatentable over Schuster in view of Kotchick

Claim 1 recites, for example, a lithographic apparatus having a level sensor that contains first and second reflectors (e.g., Figure 2, elements 2, 4), wherein the magnitude of an apparent surface depression of a wafer (e.g., Figure 2, element 3a) resulting from translation of the beam (e.g., Figure 2, elements 1a, 1) at the first and second reflector surfaces is less than 35 nm.

The Examiner asserts that it would be obvious to combine the teachings of Schuster with the teachings of Kotchick to arrive at the invention recited in rejected claim 1 (as well as the other claims listed above). Applicants respectfully disagree. First, the Examiner concedes that the combination of Schuster and Kotchick does not teach all the elements recited in the rejected claims. In particular, the Examiner expressly indicates that Schuster does not recite that a magnitude of an apparent surface depression of the wafer due to translation of a beam at the first and second reflector surfaces is less than 35nm.

Second, in order to cure this deficiency in the prior art, the Examiner asserts that it would be obvious to one of ordinary skill to adjust mirrors to obtain a minimum apparent depression in order to obtain accurate measurement of the height of the wafer surface. However, Applicants can find no support in the supplied references for this assertion. Schuster and Kotchick both fail to disclose this concept. Schuster discloses a "focus detection system" (Figure 1, element 20) that includes mirrors 22, 24, and substrate 26. Nowhere does Schuster (nor Kotchick) disclose or suggest the phenomenon of an apparent surface depression of a wafer due to reflection of a beam from a mirror surface. Thus, without a showing that the surface depression effect caused by mirrors is even *recognized* in the art, the Examiner has not demonstrated support for the assertion

that one of ordinary skill in the art would be motivated to minimize the apparent surface depression effect caused by mirrors in order to make more accurate wafer height measurements.

Third, one of ordinary skill in the art would not be motivated to combine the lithography apparatus of Schuster with the dual layer mirrors of Kotchick, to arrive at the claimed invention. The lithographic art described in Schuster and the present invention relates to imaging patterns onto substrates, among other things. Sensors having mirrors are used within such an apparatus to conveniently detect positions, such as wafer positions. The art area of Kotchick relates to displays (see abstract) that can operate in a reflective mode or a transmissive mode. The multilayer mirrors disclosed in paragraph [0053] of Kotchick are used to tailor the properties of displays. However, no motivation to combine Schuster and Kotchick has been provided. One of ordinary skill in the art of lithography, seeking to reduce the wafer surface depression artifacts induced by mirrors, would have no obvious reason to apply multilayer display mirrors in Kotchick to solve this problem. Accordingly, for this additional reason, even if it is assumed *arguendo* that one of ordinary skill might be (aware of and) motivated to minimize the apparent surface depression effect caused by mirrors (for which no evidence has been given), the combination of Schuster and Kotchick cannot be properly combined to render claim 1 obvious under 35 U.S.C. § 103(a).

The same arguments as set forth above with respect to claim 1, apply to independent claims 44, 48, and 53, which recite similar subject matter.

Accordingly, Applicants submit that claims 1, 44, 48, and 53 should be in allowable condition. At least for their dependence on allowable claims, claims 2-14, 45-47, and 49-52 should also be allowable.

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Rejection of claims 7 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Schuster in view of Kotchick and further in view of Kawaguchi

In view of the above, claims 7 and 8 should be allowable, if only for their dependence on claim 1. However, to the extent that a rejection is still maintained, Applicants note that Kawaguchi fails to teach the feature of a first surface configured to direct the beam toward the wafer surface and a second surface that is oriented in a same direction as the first surface, as recited in claims 7 and 8. The first and second surfaces 6c and 6b of Kawaguchi, relied upon by the Examiner, constitute surfaces that are *not* oriented in the same direction (see Fig. 1). Accordingly, for this additional reason, claims 7 and 8 should be in condition for allowance.

In view of the foregoing, all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone applicants' undersigned representative at the number listed below.

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Attachments:

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